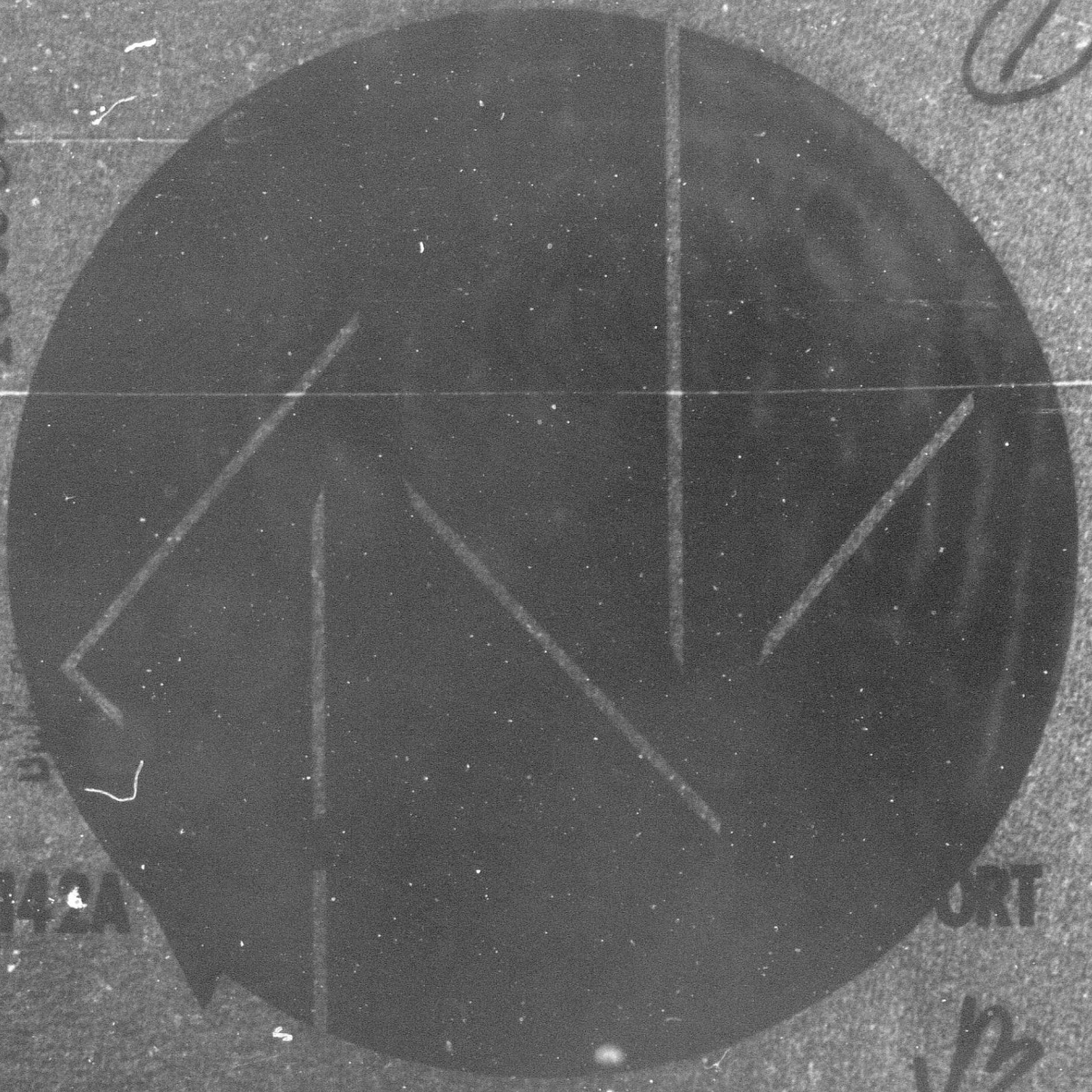

XC-142A

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MONTHLY PROGRESS REPORT

VOLUME NO.

LTV

(6) XC-142A

VTOL TRANSPORT PROGRAM.

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(9) MONTHLY PROGRESS REPORT. no. 48

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(11) Dec 65,

(12) 16 p.

W. J. Hesse

(10) W. J. Hesse,
~~Vice President-Program Director~~
V/STOL Programs

(212 445)

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INTRODUCTION

This report has been prepared in accordance with the requirements of Item 7 of the Contract Number AF33(657)-7868 and is the forty-eighth in a series of monthly reports covering activity on the XC-142A VTOL Transport Aircraft Program.

This report is devoted specifically to a summary of progress for the month of December 1965.

Brig. General F. K. Everest Being Congratulated by V/STOL Program Director Upon Completion of Flight in XC-142A Aircraft.

SUMMARY

Flight test operations were resumed on 3 December, when No. 1 aircraft made the first flight since the 19 October ground loop on No. 2 aircraft. During the month, No. 1 aircraft made a total of 14 flights for 9 hours 33 minutes flight time, bringing the total cumulative time for the aircraft to 50 hours 16 minutes in 69 flights. Significant flight test accomplishments during the month included acoustical measurements, engine jet thrust determination, flying quality evaluation, off-flap programming, and longitudinal static stability investigations. On 28 December, Brig. General P. K. Everest, Commander, 4520 Combat Crew training wing, Nellis Air Force Base flew the aircraft as co-pilot, accomplishing conversions, reconversions and hover work. At the end of the reporting period, a total of 18 persons had flown the XC-142A aircraft including two Air Force general officers.

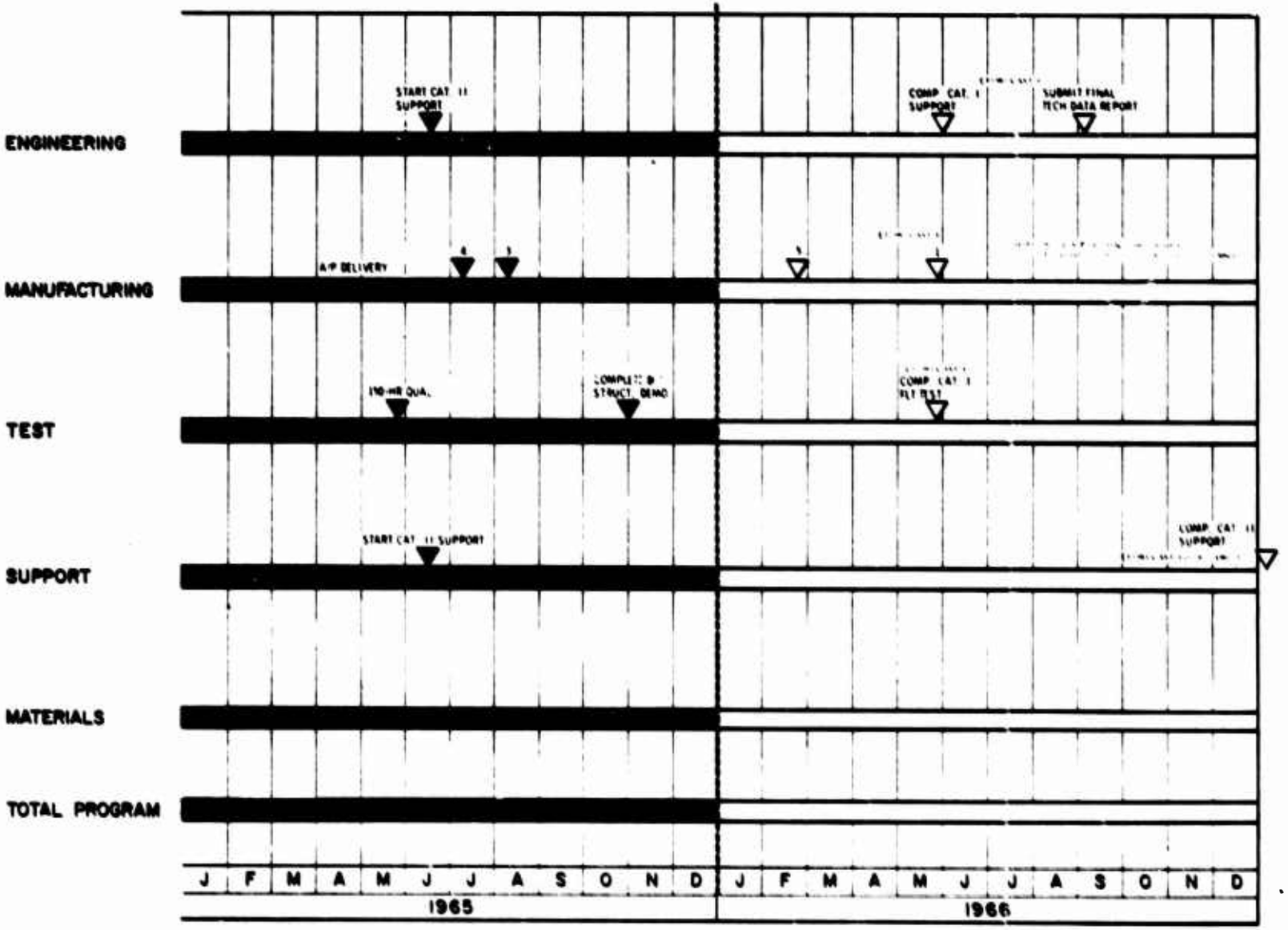
No. 2 aircraft remained in dormant status throughout the period, awaiting a decision on repair of the aircraft. At Edwards AFB, No. 3 aircraft returned to flight status on 14 December and made four flights for aircraft shakedown and stability and control investigations before the end of the period. No. 4 aircraft remained in layup throughout the month. Preflight operations were underway at the close of the period with return to flight status expected in January 1966.

No. 5 aircraft remained in the final assembly line undergoing completion of fabrication and installation effort. Work was essentially on schedule toward a shop completion date of 21 January, with first flight expected in February.

At the end of December, the first four aircraft had achieved 214 flights and 164 hours, 5 minutes of flight time.

V/S²TOL - XC-142A LTV AEROSPACE CORP.

PROGRAM STATUS



ITEM 1.A DEVELOPMENT OF XC-142A AND FABRICATION OF FIVE PROTOTYPE MODELS

No repair work was initiated on No. 2 aircraft, which was damaged in a ground loop on 19 October, pending a decision on disposition of the aircraft. No. 5 aircraft remained in the final assembly line undergoing completion of installation effort. Shop completion of this aircraft was expected in late January, with first flight in February.

ITEM 1.B FABRICATION OF STATIC TEST ARTICLE (Completed)

ITEM 2 FABRICATION OF MOCKUP (Completed)

ITEM 3 GROUND TEST PROGRAM

3.1 STRUCTURAL TESTS (Completed)

3.2 TRANSMISSION SYSTEM TESTS (Completed)

3.3 SYSTEM TESTS - With the exception of a few components such as the long stroke flap actuator, the wing incidence actuator, the electro mechanical trim actuator, and the wing flap programmer, XC-142A component and system qualification testing was complete. Of the 93 components designated as surveillance items by ASD, all but seven had been certified as being qualified. Two of the seven, namely, engine inlet duct anti-icing tests and heat and vent system tests, were being conducted at LTV; the remaining five items were being tested by vendors. In connection with the engine nacelle inlet duct anti-icing, all tests of the system were complete with the exception of tests on the LTV engine test stand to confirm proper flow distribution. These tests are expected to be complete in January. Operational tests of the revised aircraft heating system are planned to be conducted on No. 5 aircraft in January and February. Tests of the long stroke flap actuator, the wing flap programmer and wing incidence screwjack actuator were expected to be complete by 31 January.

ITEM 4 ENGINEERING DATA

4.1 ACCOMPLISHMENTS

During December, the Engineering effort continued to be devoted to support of the flight test program, as well as to fabrication of the No. 5 aircraft. For the most part, work continued to be centered around design changes to correct discrepancies uncovered during flight testing. Data concerning the changes were forwarded to ASD for review and disposition, and to WRAMA for assignment of Time Compliance Technical Order (TCTO) numbers. Work continued on preparation of the accident report of the No. 2 aircraft. The report was completed in late December and will be forwarded to ASD in January. Weight of the aircraft at the close of the reporting period was 2621 pounds over guarantee.

4.2 PROBLEM AREAS

4.2.1 Static Thrust Deficiency - Fabrication of the first set of new propeller blades (2FF) by Hamilton Standard was completed in December. The blades were shipped to Wright-Patterson AFB on 21 December for whirl testing which is to begin in early January. The first airplane set of blades is to be available in early February for installation on the No. 1 XC-142A aircraft.

4.2.2 Longitudinal Stability - The extended leading edge UHT is to be incorporated on the No. 1 aircraft for flight testing during its next major layup which is expected to begin in mid-January and be complete in February.

4.2.3 Reduced Cruise Performance - As reported previously, a substantial improvement in cruise performance can be obtained by the addition of propeller spinners and removal of auxiliary oil coolers from the right hand nacelles. The Contractor's proposal covering this was in preparation at the end of the month. The Contractor forwarded a technical status report of the cruise drag program to ASD in late December.

4.2.4 Directional Disturbance in Ground Effect - The program to determine the action required to correct directional disturbance in ground effect at wing angles between 35 and 70 degrees continued. During December, the investigation consisted of further flight testing utilizing the No. 1 XC-142A aircraft and wind tunnel tests. In flight testing, evaluation in ground effect of wing settings ranging up to 60° with various flap settings was completed. Satisfactory penetrations and touchdowns were accomplished in the 40 and 45 degree wing settings with optimum flap settings; at wing settings of from 45 to 55 degrees, disturbances were encountered at touchdown and at settings for 55 and 60 degrees, the disturbances were encountered between 10 and 20 feet. All tests were conducted with slats in the extended condition. Several points will be tested in January with the slats retracted. Wind tunnel tests were initiated in late December utilizing the 0.11 scale model to determine the cause of the directional disturbances. The model was being used in the powered configuration over an adjustable height ground board. A report of the directional recirculation investigation program outlining the work completed to date and the remaining planned tasks was forwarded to ASD on 20 December 1965.

ITEM 5 DESIGN DATA

5.1 STATUS OF DESIGN DATA

Status of design data and surveillance data at the close of the reporting period was as follows:

	Design Data	Surveillance	Total
Total Submissions to Date	215	245	460
Total Submissions to Gc	4	7	11
Grand Total	219	252	471
Percent Complete	95%	95%	95%

5.2 SCN STATUS

As of 31 December, a total of 247 specification change notices against contract reports were submitted. Of these 220 were approved, 19 were disapproved, and 8 were pending.

ITEM 6 FLIGHT TEST

Fourteen flights were conducted utilizing the No. 1 aircraft during the month of December as shown below:

Flight No.	Date	Time
56	12/3	:06
57	12/6	1:16
58	12/7	1:06
59	12/7	:42
60	12/8	:28
61	12/9	:11
62	12/16	:36
63	12/16	:31
64	12/17	:45
65	12/21	:54
66	12/27	:10
67	12/28	:58
68	12/28	:43
69	12/30	1:07

The total flight time of 9 hours and 33 minutes for these flights brings the cumulative total for No. 1 airplane to 50 hours and 16 minutes. Prior to flight 62, high vibration levels were encountered in the No. 3 nacelle. During the ensuing investigation, the No. 3 propeller pitch actuator, and the flex couplings inboard and outboard of the No. 3 nacelle were replaced. While changing the flex coupling, the torque on the steel nut on the inboard curvic adapter was found to be low although it remained locked. This nut was properly torqued and the vibration level on a subsequent ground run was found to be normal.

Significant accomplishments during the month of December were as follows:

- Acoustical survey in hover and STOL and in cruise flights at 5,000, 10,000 and 15,000 feet

- Engine jet thrust determination

- Evaluation of flying qualities in hover, STOL and verticircuits with the cargo door open at 15 percent CG

- Off flap programming from 40° to 60° wing incidence

- Longitudinal static stability at 17%, 23% and 18% CG. Maximum speed attained at 28%, 240 KEAS at 7500 and 15,000 feet

- Flight by Brig. General F. K. Everest as co-pilot, bringing the total to 18 persons who have flown the XC-142A. This includes 8 company pilots and 10 military pilots

- Determination of wing strain gage repeatability

ITEM 7 REPORTS

The Technical Progress Report for the month of November 1965 was submitted to ASD on 31 December. The Financial Report for November was submitted on 27 December.

ITEM 8 SPARE PARTS FOR FIVE PROTOTYPE AIRPLANES

Spare parts status at the end of the reporting period was as follows:

993 Total line items scheduled for shipment to bonded warehouse (decrease of 28 since last report)

202 Total line items scheduled for direct shipment to vendor for overhaul

1195 Total line items on order to date

ITEM 9 DEVELOPMENT AND FABRICATION OF AGE

The status of AGE development and fabrication at the end of December was as follows:

Through December	Submitted	Approved	Demonstrated
CFE-AGERD	170	118	112
GFE-AGERD	64	59	32
	234	177	144

ITEM 10 SPARE PARTS FOR AGE - No activity during December.

ITEM 11 TRAINING AND TRAINING EQUIPMENT

A special training course, OHC 135-1, Pilots Ground School, was conducted for fifteen military and civilian personnel on 6-10 December.

ITEM 12 CONTRACTOR SUPPORT OF FLIGHT TEST PROGRAM

Aircraft No. 3 and 4 remained at Edwards Air Force Base throughout the month for Category II flight testing. At the beginning of the period, reworked actuators for No. 3 aircraft had been received from Dallas and were being installed. The aircraft returned to flight status on 14 December and made four flights as follows:

EAFB FLIGHT	DATE	TIME	CREW
10	12/14	0:12	Rich/Jones
11	12/15	0:30	Jones/Chubboy
12	12/20	0:48	Chubboy/Rich
13	12/21	1:36	Chubboy/Jones

These flights brought the total flight time on No. 3 aircraft subsequent to delivery to 13 hours and 36 minutes. Since first flight, the aircraft had flown a total of 46 hours and 42 minutes.

No. 4 aircraft did not fly during the reporting period. All reworked parts were received from Dallas and installed during the month and the aircraft was undergoing rigging and operational checkout of systems. A number of minor retrofit mods were also incorporated during the period. Return to flight status was expected for early January. Total flight time on the aircraft remained at 18 hours and 24 minutes in 15 flights since delivery and a cumulative total of 24 flights for 27 hours and 38 minutes since first flight.

VISITS TO CONTRACTOR FACILITY DURING DECEMBER

Date	From	Purpose
2	Office of Joint Chiefs of Staff and Deputy Director R&D OSD	Program Briefing
7	Industrial College of the Armed Forces	Program Briefing
9	USN, OPTEVFOR	Program Briefing
11	USN, CNARESTRA	Program Briefing
23	USAF Vice Chief of Staff	Program Briefing
28	Cdr. 4520 Combat Crew Training Wing, USAF	Program Briefing

ECP INDEX

ECP No.	Title	Status
1	Fuselage, Installation of Aft Fuselage Escape Doors	Disapproved
2	Electrical, Installation of 35 KVA Generators	Disapproved
3	Electronics, Additional AT-256A/ARC UHF Communications Antenna; Installation of	Disapproved
4	Flight Tests, Category I Inflight Load Survey; Elimination of	Authorized
5	Ground Tests, Escape System Sled Tests; Elimination of	Authorized
6	Fuel System, Ferry Fuel Tank; Elimination of	Authorized
7	Escape System, Douglas Escapac 1-C Ejection Seat in Lieu of LW-1 (Modified) Seat; Installation of	Cancelled
8	Furnishings; Cargo, Troop Accessories for Four Airplanes, Elimination of	Authorized
9	Ground Test, Wing Fatigue Test; Elimination of	Authorized
10	Structural Demonstrator Instrumentation, Addition of	Authorized
11	Ground Test, Structural Failing Load Test, Elimination of	Authorized
12	Navigation Equipment, AN/ARC-21C in Lieu of AN/ARN-52 (V); Provisions for	Disapproved
13	Propulsion System, Integral Gearbox Propeller System Test; Reduction of	*
14	Drawing Quality Requirements; Reduction of	*
15	Weight Control Policy; Revision of	Disapproved
16	Main Propeller IGC Bearing Change	Authorized

ECP No.	Title	Status
17	Aluminum Forging Treatment to Improve Corrosion Resistance	Cancelled
18	Redesign Main Propeller Blade; Full Scale Test at NASA-Ames	Authorized
18-1	Redesign Main Propeller Blade; 0.60 Scale Test at NASA-Ames	Authorized
19	Elimination of Engine Nacelle Anti-Icing	Cancelled
20	Deletion of Category I Flight Tests on No. 4 Aircraft	Authorized
21	Cargo Compartment Trim; Elimination of	Disapproved
22	Revision to Engine Throttle Control Mechanism	Authorized
23	Extension of Category I Flight Test Program	Disapproved
24	Retrofit of Power Takeoff Engine Units	Authorized

* No longer identified as ECP.

CCN INDEX

CCN No.	Title	Date
1	Substitute 35 KVA Generator for 25 KVA Generator	12-19-62
2	Reduction in Data Requirements and Engine Designation Change	4-26-63
3	Substitute 25 KVA Generator for 35 KVA Generator	2-04-63
4	Reduction in IGB Propeller Testing	5-03-63
5	Approval of ECPs 4-9	6-05-63
6	Elimination of Structural Failing Load Tests	7-23-63
7	Approval of ECPs 5, 6, 8, 9, 16	7-23-63
8	Additional Electronic Support Equipment	7-19-63
9	Cancellation of CCNs 5 and 7 and Approval of ECPs 5, 6, 8, 9, 16	8-02-63
10	Partial Cancellation of CCN No. 2 and Reinstatement of Reduction in Data Requirements	8-22-63
11	Partial Cancellation of CCN No. 2 and Reinstatement of Engine Designation Change	8-22-63
12	Approval of ECP 18-1	9-30-63
13	Approval of ECPs 4 and 10	11-13-63
14	Approval of ECP 18	11-19-63
15	Approval of Revision to Contract Data Requirements Document	12-05-63
16	Approval of ECP 20	2-19-64
17	Approval of Inspection of Damaged Engine	3-16-64

CCN INDEX

CCN No.	Title	Date
18	Incorporation of Revision A to Detail Spec into Item 1 of Basic Contract	6-04-64
19	Approval of ECP-24	6-15-64
20	Dynamic Analysis of VTOL Thrust Stand	11-9 -64
21	Maintenance of Flight Control Simulator	12-4 -64
22	Revision of Maintenance Manual for Addition of Repair Data	2-15-65
23	Flight and Maintenance Manuals Revision	4- 5-65
24	In-Flight Load Measurement Program	5-10-65
25	Cool Suit Provisions	5-28-65
26	Category II Instrumentation Modification on Aircraft Numbers 1 and 3	6- 7-65
27	Study for Reduction of STOL Landing Distance	6-15-65
28	Improved Braking System	6-15-65
29	Category II Instrumentation Modification on Aircraft Numbers 1 and 3	6-22-65
30	Conditional Acceptance of No. 4 Aircraft	7- 7-65
31	Removal of Parts from Flight Control Simulator	7-26-65
32	Conditional Acceptance of No. 3 Aircraft	7-27-65

LIST OF ABBREVIATIONS

A/C	Aircraft
AGE	Aerospace Ground Equipment
AGERD	Aerospace Ground Equipment Requirements
AMC	Army Materiel Command
APU	Auxiliary Power Unit
ASD	Aeronautical Systems Division
ATC	Air Training Command
CCN	Contract Change Notice
CFE	Contractor Furnished Equipment
CSD	Constant Speed Drive
DIET	Design Information Element Test
EAFB	Edwards Air Force Base
ECP	Engineering Change Proposal
GFE	Government Furnished Equipment
IGC	Integral Gear Case
PERT	Program Evaluation and Review Technique
PITS	Propulsion Integrated Test Stand
QEC	Quick Engine Change
SPO	Systems Program Office
TBO	Time Between Overhauls
UHT	Unit Horizontal Tail
WRAMA	Warner Robbins Air Materiel Area